

**National Marine Fisheries Service Endangered Species Act (ESA)
Section 7 Consultation Biological Opinion and Conference Opinion and
Magnuson-Stevens Act (MSA) Essential Fish Habitat Consultation
ESA Section 7 Consultation Number 2005/00771**

Action Agency: NOAA's National Marine Fisheries Service (NMFS)

Species/Evolutionarily Significant

Units (ESUs) Affected: Upper Columbia River (UCR) Steelhead (*Oncorhynchus mykiss*)

Essential Fish Habitat

Affected: Chinook (*O. tshawytscha*) salmon

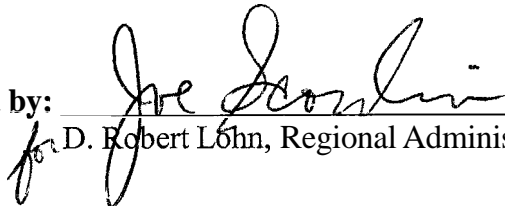
Activities Considered: Issuance of Permit 1520 to the Confederated Tribes of the Colville Reservation (Colville Tribes)

Consultation

Conducted by: Salmon Recovery Division, Northwest Region

This Biological Opinion constitutes National Marine Fisheries Service (NMFS) consultation under Section 7 on NMFS' intention to issue ESA Section 10(a)(1)(A) Permit 1520, authorizing take of ESA-listed Upper Columbia River (UCR) steelhead during smolt trap operations in the Okanogan River to monitor populations of UCR steelhead as part of a basin-wide status and effectiveness monitoring program. It has been prepared in accordance with Section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 et seq.), the MSA of 1996, and in compliance with the Data Quality Act (§5 15 of PL 106-554). Additionally, it constitutes the conference consultation with regard to potential impacts on proposed critical habitat. It is based on information provided by the Colville Tribes, published and unpublished scientific information on the biology and ecology of endangered steelhead in the action area, and other sources of information. A complete administrative record of this consultation is on file with the Salmon Recovery Division in Portland, Oregon.

Approved by:


for D. Robert Lohn, Regional Administrator

Date:

8/10/05

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1 INTRODUCTION

1.1 Consultation History

The 2000 and 2004 Biological Opinions on the Federal Columbia River Power System (FCRPS) require the development and implementation of a coordinated monitoring and evaluation (M&E) program (NMFS 2000, 2004a). Although these Biological Opinions have been the subject of ongoing litigation, the need for comprehensive and coordinated monitoring in the Columbia River Basin remains a high priority. Additionally, there have been numerous administrative and scientific calls for a comprehensive M&E program to provide consistent, region-wide information about the status of salmon populations and their response to management actions (Botkin *et al.* 2000; ISAB 2001). Currently natural production of juvenile salmonids in the Wenatchee, Entiat, and Methow River Basins are monitored as a coordinated effort among Washington Department of Fish and Wildlife (WDFW), the Confederated Tribes and Bands of the Yakama Nation (YN), and the United States Fish and Wildlife Service (USFWS) authorized pursuant to the ESA under Section 10, Permits 1395 (WDFW) (NMFS 2003a), 1196 (WDFW) (NMFS 2004b), 1347 (WDFW) (NMFS 2003b), and 1493(YN) (NMFS 2004b), and Section 7 Consultation (USFWS) (NMFS 2003b). The proposed study is to conduct similarly coordinated monitoring in the Okanogan River Basin conducted by the Confederated Tribes of the Colville Reservation (Colville Tribes). This monitoring was previously contemplated in Permit 1395 issued to the WDFW (NMFS 2003a). The WDFW has stated that they do not intend to carry out the monitoring activities in the Okanogan River and are supportive of the Colville Tribes conducting the work under a separate permit (WDFW 2005). Hence, the Colville Tribes have applied for a Section 10 permit in order to conduct the monitoring activities.

1.2 Analysis Framework

Over the course of the last decade and hundreds of ESA Section 7 Consultations, NMFS developed the following approach for applying the ESA Section 7(a)(2) standards as defined by 50 CFR §402.02 when determining what effect a proposed action is likely to have on a given listed species. This analysis format will be used in this Biological Opinion (Opinion):

1. Describe the proposed action (Section 2).
2. Define the biological requirements and current status of each listed species and the relevance of the environmental baseline to the species' current status in the action area (Section 3).
3. Determine the effects of the proposed or continuing action on listed species and their habitat and evaluate any cumulative effects within the action area (Section 4).

4. Evaluate whether the effects of the proposed action, taken together with any cumulative effects and added to the environmental baseline, can be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of the affected species or is likely to destroy or adversely affect their designated critical habitat (Section 5).

2 PROPOSED ACTION

The Colville Tribes, with funding from the Bonneville Power Administration (BPA), have proposed to conduct part of the implementation of a basin-wide monitoring effort (BPA Project #2003-022-00) in coordination with NMFS, the WDFW, Washington State Department of Ecology (Ecology), the USFWS, and the United States Forest Service (USFS). This proposal (CCT 2005) will allow researchers to estimate natural steelhead production and productivity; calculate annual population estimates, egg-to-emigrant survival, and emigrant-to-adult survival rates; and collect data and provide population estimates for ESA-listed steelhead. Population estimates will be used to evaluate the effects of supplementation programs in the Okanogan River Basin as well as to provide data from the Okanogan River to develop a spawner-recruit relationship to better chart the progress of other actions taken in the subbasin, including actions designed to assist in recovery. The permit would expire on December 31, 2010.

2.1 Monitoring Activities

Operating procedures and techniques were adapted from Murdoch *et al.* (2000) and follow the standardized basin-wide monitoring plan developed by the Upper Columbia Regional Technical Team for the Upper Columbia Salmon Recovery Board (Hillman 2004). Additional details can be found in the permit application (CCT 2005). A summary of proposed operating procedures and techniques is as follows:

- A rotary screw trap will be operated annually in Okanogan River from March 1, through November 30.
- The rotary screw trap will be operated continuously, seven days per week, during the sampling period defined above.
- A two-person crew will operate the trap; two biological technicians will rotate through this crew and will be assisted by one fish biologist who is the team leader.
- The trap live box will be checked a minimum of once a day (morning) or more often as needed due to debris and fish movement.
- All fish will be removed from the live box and placed into an anesthetic solution of MS-222 each time the trap is checked.
- All fish will be identified as to species and life stage (e.g., fry, juvenile, adult) and enumerated.
- Anadromous species will be evaluated for degree of smoltification (i.e., parr, transitional, or smolt).
- All fish will be examined for external marks (e.g., clipped fins) and scanned for internal tags (e.g., coded-wire or Passive Integrated Transponder (PIT)).

- At least a portion of each species caught will be biologically sampled, including measuring and recording fork length and weight.
- Scale samples will be randomly collected throughout the emigration period from species with multiple year-class smolts (i.e., steelhead).
- All fish will be allowed to fully recover in fresh water prior to being released in an area of calm water downstream from the smolt trap.
- Environmental conditions will be recorded each time the live box is checked.
- Mark-recapture trials for target species will be conducted throughout the trapping season to develop a discharge-trap efficiency linear regression model to estimate daily trap efficiency.
- Marks (e.g., fin-clips) or tags (e.g., PIT tags) will be used to assess the trap capture rate described above.
- No fewer than 100 fish will be used for each mark-release trial.
- Parr and smolts will be marked by clipping the tip of either the upper or lower lobe of the caudal fin, alternating fin clip locations for each trial.
- All marked or tagged fish will be allowed to recover in a live pen for at least 8 hours before being transported to a release site at least 0.6 river miles upstream of the trap.
- Trap efficiency and populations estimates will be calculated as described by Murdoch *et al.* (2000) and Hillman (2004).
- A Fulton-type condition factor will be calculated following methods described by Anderson and Neumann (1996).
- Quarterly, annual, and any other progress reports required by this Opinion will be prepared and submitted as described in the statement of work for Project #2003-022-00 (NOAA 2003).

2.2 Take Estimates

The annual take of ESA-listed species is estimated as a proportion of the total number of juvenile fish produced in Okanogan River annually (Table 1). Take will be in the form of capturing, handling, biological sampling, marking or tagging, and releasing of ESA-listed Upper Columbia River (UCR) steelhead. None of this take is intended to be lethal, though there is potential for some incidental mortality associated with the handling; all anticipated effects of the take, including both non-lethal and lethal effects, are included in the analysis.

Table 1. Estimated maximum annual take of Upper Columbia River steelhead juveniles associated with the operation of a rotary smolt trap as a proportion of the total annual juvenile production in Okanogan River (CCT 2005).

Naturally Produced UCR Steelhead		Hatchery UCR Steelhead	
<i>Non-lethal</i>	<i>Lethal (indirect mortality)</i>	<i>Non-lethal</i>	<i>Lethal (indirect mortality)</i>
20% in Okanogan River Basin	2.0% in Okanogan River Basin	20% in Okanogan River Basin	2.0 % in Okanogan River Basin

2.3 Permit Conditions

The ESA directs NMFS to specify permit terms and conditions to ensure that the activities conducted will not jeopardize the continued existence or recovery of the listed species affected. The “Permit Holder” is the Colville Tribes and anyone acting as their agent. In addition to the general conditions and reporting requirements, the permit would contain the following special conditions:

A. Take Description and Levels

1. This permit is for activities to be conducted over a period of five-years. Annual take authorization listed below is subject to the annual authorization process (see Section B - Reports and Annual Authorization Requirements) during the period that this permit is valid.
2. The Permit Holder must ensure that listed species are taken only at the levels, by the means, in the areas, and for the purposes stated in the permit application, and according to the terms and conditions in this permit.
3. The Permit Holder may operate a rotary screw fish trap continuously in the Okanogan River, Washington annually from March 1, through November 30.
4. The Permit Holder may capture, handle, and release up to 20 percent of the naturally produced and artificially propagated UCR steelhead juveniles in the Okanogan River using standard juvenile fish trapping techniques such as the rotary screw trap.
5. Lethal take of UCR steelhead, as determined by observation of mortalities in the trap or prior to release, may not exceed two percent of the fish captured.
6. For the purposes of developing population estimates, the Permit Holder may apply marks (e.g., caudal fin clip) or tags (e.g., coded-wire or PIT) to the UCR steelhead juveniles prior to release.
7. Each ESA-listed fish handled out-of-water for the purpose of recording biological information must be anesthetized. Anesthetized fish must be allowed to recover (e.g., in a recovery tank) before being released. Fish that are simply counted must remain in water but do not need to be anesthetized.
8. ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during sampling and processing procedures. Adequate circulation and replenishment of water in holding units is required. When a mix of species is captured, ESA-listed fish must be processed first. The transfer of ESA-listed fish must be conducted using equipment that holds water during transfer (e.g., sanctuary net or bucket).

9. ESA-listed fish must not be handled if the water temperature exceeds 69.8°F (21°C) at the capture site. Under these conditions, ESA-listed fish may only be identified and counted.
10. Tissue samples and/or scales collected during activities authorized above may be transferred to the Washington Department of Fish and Wildlife or NMFS laboratories for analysis and/or maintained in an archive.

B. Reports and Annual Authorization

NMFS contact for all reports:

National Marine Fisheries Service
Salmon Recovery Division
1201 N.E. Lloyd Blvd, Suite 1100
Portland, Oregon 97232-1274
Phone: (503) 230-5407
Fax: (503) 872-2737

1. Quarterly, annual, and Biological Opinion reports must be completed by the Permit Holder and submitted to NMFS Salmon Recovery Division as described in the statement of work for project #2003-022-00.
2. Monthly summary reports are due to NMFS by the tenth working day of the following month and comprehensive annual reports are due to NMFS by December 31 of the sampling year.
3. The Permit Holder must notify NMFS as soon as possible, but no later than two days, after any authorized level of take is exceeded or if such an event is likely. The Permit Holder must submit a written report detailing why the authorized take level was exceeded or is likely to be exceeded.
4. The Permit Holder must provide plans for future projects and/or changes in sampling locations or research protocols and obtain approval from NMFS prior to implementation of such changes.
5. The Permit Holder must report the take of any ESA-listed species not included in this permit when it is killed, injured, or collected during the course of enhancement/research activities authorized under this permit. Notification should be made as soon as possible, but no later than two days after the unauthorized take. The Permit Holder must then submit a detailed written report of the non-permitted take. Pending review of these circumstances, NMFS may suspend research activities.

C. General Conditions

1. The Permit Holder shall ensure that the ESA-listed species are taken only by the means, in the areas, and for the purposes set forth in the permit application, as limited by the terms and conditions in this permit.
2. The Permit Holder must coordinate with other co-managers and researchers to ensure that no unnecessary duplication and/or adverse cumulative effects occur as a result of the Permit Holder's activities. This coordination shall include, but is not limited to, the Washington Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, and NMFS.
3. The Permit Holder must ensure that all ESA-listed species are handled carefully. Should NMFS determine that a procedure provided for under this permit is no longer acceptable, the Permit Holder must immediately cease such activity until NMFS determines an acceptable substitute procedure.
4. The Permit Holder, in effecting the take authorized by this permit, is considered to have accepted the terms and conditions of this permit and shall be prepared to comply with the provisions of this permit, the applicable regulations, and the ESA.
5. The Permit Holder is responsible for the actions of any individual operating under the authority of this permit. Such actions include capturing, handling, releasing, transporting, maintaining, and caring for any ESA-listed species authorized to be taken by this permit.
6. The Permit Holder, personnel, or designated agent, acting on the Permit Holder's behalf, must possess a copy of this permit when conducting the activities for which a take of ESA-listed species or other exception to ESA prohibitions is authorized herein.
7. The Permit Holder may not transfer or assign this permit to any other person(s), as person is defined in Section 3(12) of the ESA. This permit ceases to be in force or effective if transferred or assigned to any other person without prior authorization from NMFS.
8. The Permit Holder must obtain any other Federal, state, and local permits/authorizations necessary for the conduct of the activities provided for in this permit. In addition, before taking ESA-listed species in the territorial waters of a foreign country, the Permit Holder must secure consent from, and comply with the appropriate laws of, that country.
9. Any personnel of the Permit Holder requiring Federal or state licenses to practice their profession must be duly licensed under the appropriate law.
10. The Permit Holder must allow any NMFS employee(s) or any other person(s) designated by NMFS to accompany field personnel during the activities provided for in this permit. The Permit Holder must allow such person(s) to inspect the Permit Holder's records and facilities if such records and facilities pertain to ESA-listed species covered by this permit or NMFS' responsibilities under the ESA.

11. Under the terms of the regulations, a violation of any of the terms and conditions of this permit will subject the Permit Holder, and/or any individual who is operating under the authority of this permit, to penalties as provided for in the ESA.
12. The Permit Holder is responsible for biological samples collected from ESA-listed species as long as they are useful for research purposes. The terms and conditions concerning any samples collected under this authorization remain in effect as long as the Permit Holder maintains authority and responsibility of the material taken. The Permit Holder may not transfer biological samples to anyone not listed in the application without obtaining prior written approval from NMFS. Any such transfer will be subject to such conditions as NMFS deems appropriate.
13. The Salmon Recovery Division, NMFS, may amend the provisions of this permit after reasonable notice to the Permit Holder.
14. 50 CFR Section 222.23(d)(8) allows NMFS to charge a reasonable fee to cover the costs of issuing permits under the ESA. The fee for this permit has been waived.
15. NMFS may revoke this permit if the activities provided for by it are not carried out, if the activities are not carried out in accordance with the conditions of the permit and the purposes and requirements of the ESA, or if NMFS otherwise determines that the findings made under Section 10(d) of the ESA no longer hold.
16. Any falsification of annual reports or records pertaining to this permit is a violation of this permit.
17. The permit holders, in signing this permit, have accepted and will comply with the provisions of this permit, applicable regulations (50 CFR 222), and the ESA.

D. Penalties and Permit Sanctions

1. Any person who violates any provision of this permit is subject to civil and criminal penalties, permit sanctions, and forfeiture as authorized under the ESA and 15 CFR part 904 [Civil Procedures].
2. All permits are subject to suspension, revocation, modification, and denial in accordance with the provisions of subpart D [Permit Sanctions and Denials] of 15 CFR part 904.

2.4 Action Area

The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR §402.02).

Effects of the activities considered in this consultation would occur in Okanogan River, a tributary to the Columbia River in Washington State. The rotary smolt trap will be placed at river mile 16.9 on Okanogan River, near the town of Malott, Washington (Figure 1). Due to the nature of the anticipated effects, particularly the extremely localized physical area of the activities and the small and transitory expected effects of trapping and handling (see the analysis, below), the effects of this proposed action would not be expected to extend measurably beyond the immediate area involved in the action.

Critical habitat was designated for UCR spring Chinook salmon and UCR steelhead in 2000 when NMFS published a final rule in the Federal Register (February 16, 2000, 65 FR 7764). However, the critical habitat designations were vacated and remanded to NMFS for new rulemaking pursuant to a court order in April 2002. Recently, a new critical habitat proposed rule was published in the Federal Register (December 14, 2004, 69 FR 74572). Therefore, conferencing under ESA Section 7 was undertaken to consider potential adverse impacts on the proposed critical habitat for the UCR steelhead Evolutionarily Significant Unit (ESU).

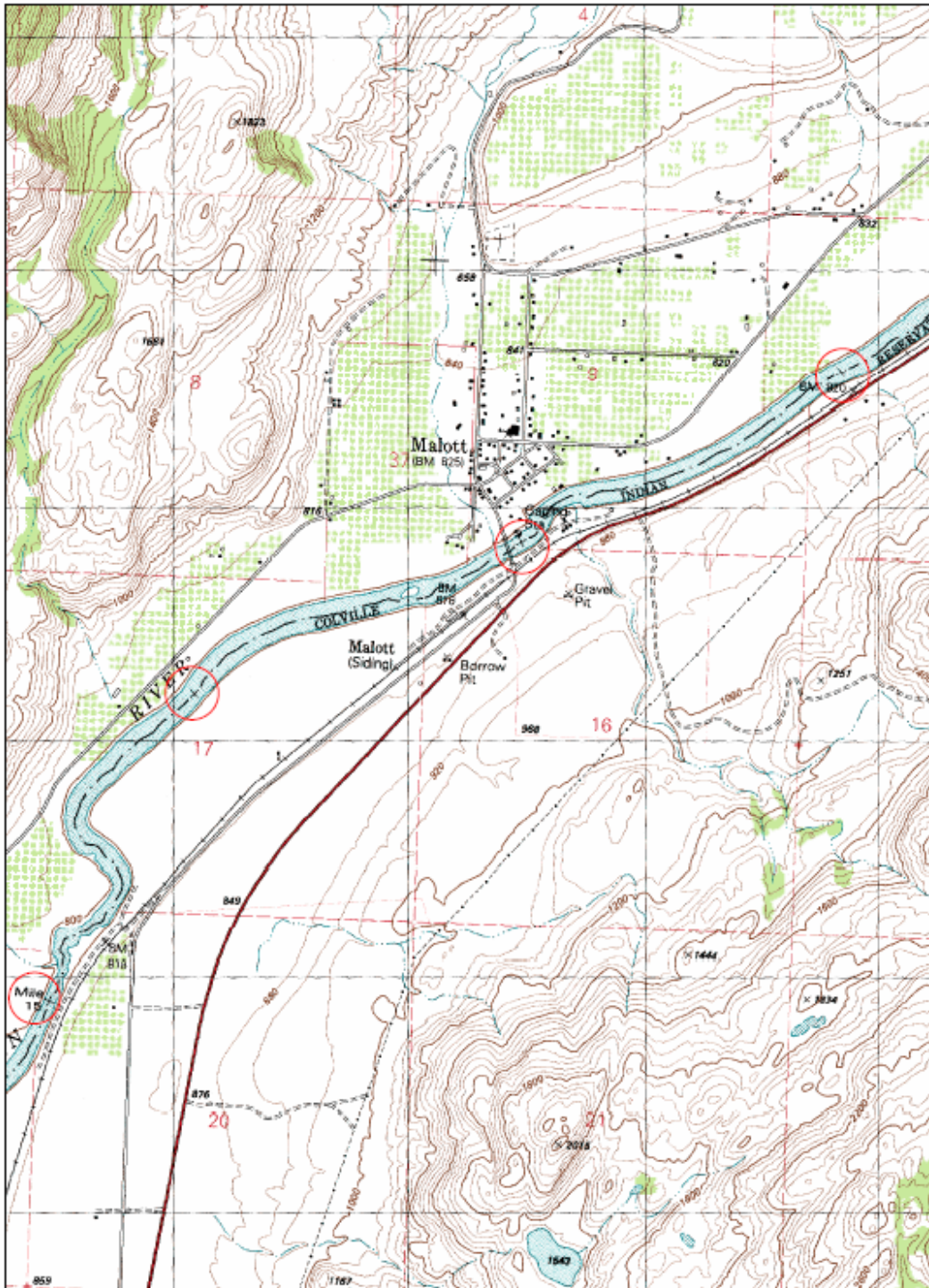


Figure 1. Map of the Okanogan River indicating the location of the proposed juvenile fish trap near the town of Malott.

3 STATUS OF SPECIES UNDER THE ENVIRONMENTAL BASELINE

The status of the species and the environmental baseline have not changed substantially from the conditions previously described in the Biological Opinions on the issuance of Permits 1395, 1196, and 1347 (NMFS 2003a, 2004b, 2003b). This Opinion provides the most recent redd count and adult return data for the UCR steelhead ESU and relies on information previously provided in the Biological Opinions cited above. This additional information does not supersede that in the previous Biological Opinions, but refines it.

3.1 Steelhead (*O. mykiss*)

Steelhead can be divided into two basic run types based on their level of sexual maturity at the time they enter fresh water and the duration of the spawning migration (Burgner *et al.* 1992). The stream-maturing type, or summer steelhead, enters fresh water in a sexually immature condition and requires several months in fresh water to mature and spawn. The ocean-maturing type, or winter steelhead, enters fresh water with well-developed gonads and spawns relatively shortly after river entry (Barnhart 1986). Variations in migration timing exist between populations. Some river basins have both summer and winter steelhead; others only have one run type. Unlike Pacific salmon, steelhead are iteroparous, or capable of spawning more than once before death. Iteroparity is more common among southern steelhead populations than northern populations (Busby *et al.* 1996). Multiple spawnings for steelhead range from three percent to 20 percent of runs in Oregon coastal streams. Steelhead spawn in cool, clear streams with suitable gravel size, depth, and current velocity. Intermittent streams may also be used for spawning (Barnhart 1986; Everest 1973).

Based on catch data, juvenile steelhead tend to migrate directly offshore during their first summer, rather than migrating nearer to the coast as do most salmon. During fall and winter, juveniles move southward and eastward (Hartt and Dell 1986). Available fin-mark and coded-wire tag data suggest that winter steelhead tend to migrate farther offshore but not as far north into the Gulf of Alaska as summer steelhead (Burgner *et al.* 1992). Maturing Columbia River steelhead are found off the coast of Northern British Columbia and west into the North Pacific Ocean (Busby *et al.* 1996). At the time adults are entering freshwater, tagging data indicate that immature Columbia River steelhead are out in the mid-North Pacific Ocean.

3.2 Upper Columbia River Steelhead

The status of the UCR Steelhead ESU was presented in the Opinion on the issuance of Permit 1395 (NMFS 2003a), which, as previously mentioned, authorizes the operation of artificial propagation programs and monitoring in the UCR Basin of listed UCR steelhead. Below is a summary of the status, including updates of information provided in the previous opinion.

The UCR Steelhead ESU, listed as endangered on August 18, 1997 (62 FR 43937), includes all natural-origin populations of steelhead in the Columbia River Basin upstream from the Yakima River, Washington, to the U.S./Canada border. NMFS proposed a status change from endangered to threatened on June 14, 2004 (69 FR 33102). Until final rulemaking on the proposed status change occurs, the current endangered status is in effect. The artificial

propagation programs of Wells-stock steelhead and the Wenatchee-stock steelhead are considered essential for recovery.

On April 4, 2002, NMFS defined interim abundance recovery targets for each spawning population in this ESU (Lohn 2002). These targets are intended to represent the number and productivity of naturally produced spawners that may be needed for recovery, in the context of whatever take or mortality is occurring. They should not be considered in isolation, as they represent the numbers that, taken together, may be needed for the population to be self-sustaining in its natural ecosystem. For UCR steelhead, the interim recovery levels are 2,500 spawners in the Wenatchee River, 500 spawners in the Entiat River, and 2,500 spawners in the Methow River (Lohn 2002). An interim target was not developed for the Okanogan River Basin. In terms of natural production, recent population abundances for both the Wenatchee/Entiat River aggregate population and the Methow population remain well below the interim recovery levels developed for these populations (BRT 2003). Subsequently, the Interior Columbia Technical Recovery Team refined the natural origin spawner goals. The Okanogan River Basin was defined as falling into the linear category defining the structural intrinsic potential of the basin and the population intrinsic potential was assessed as intermediate in size with a recovery goal of 1,000 natural origin spawners (ICBTRT 2004). Primary habitat conditions in the Okanogan Subbasin that currently limit abundance, productivity, spatial structure, and diversity (beyond natural or baseline conditions) of salmonids include a lack of habitat diversity, habitat quantity, sediment load, obstructions, a lack of channel stability, and high temperatures. Habitat diversity in the Okanogan Subbasin is affected by confined channels, loss of floodplain connectivity and off-channel habitat, reduced quantities of large woody debris, and a general lack of riparian vegetation.

Artificially propagated steelhead have been released into tributary areas with the best quality habitat to encourage their return and eventual spawning in the natural environment. In recent years artificial propagation has focused on incorporating natural-origin fish into the broodstock populations.

Naturally produced steelhead made up an average of 17.8 percent of the steelhead run at Priest Rapids Dam during the 18-year period from 1986 to 2001 (Table 2). These natural origin steelhead are not equally distributed among the UCR tributary basins (Table 3). Mullan *et al.* (1992) reported annual escapement to the Methow Basin at only 10 percent natural-origin steelhead; however, in recent years the WDFW (Snow 2004) reported natural-origin steelhead composition of 5 to 11 percent in 1998 through 2000 at Wells Dam. The steelhead escapement to the Wenatchee Basin generally includes a higher proportion of natural-origin fish, at about 57 percent with estimates of 817 and 1,773 spawners in 2001 and 2002, respectively (Murdoch and Viola 2004).

Table 2. Upper Columbia River steelhead adult returns at Priest Rapids Dam (WDFW, unpublished data).

Return Year	Artificially Propagated		Naturally Produced		Total Run
	Total	Percent	Number	Percent	
1986	20,022	90	2,342	10	22,364
1987	9,955	71	4,058	29	14,013
1988	7,530	74	2,670	26	10,200
1989	8,033	75	2,685	25	10,718
1990	6,252	80	1,585	20	7,837
1991	11,169	80	2,799	20	13,968
1992	12,102	88	1,618	12	13,720
1993	4,538	84	890	16	5,428
1994	5,880	87	855	13	6,735
1995	3,377	77	993	23	4,370
1996	7,757	90	843	10	8,600
1997	8,157	91	785	9	8,942
1998	4,919	84	928	16	5,847
1999	6,903	83	1,374	17	8,277
2000	9,023	79	2,341	21	11,364
2001	24,174	81	5,670	19	29,844
2002	12,884	81	2,983	19	15,867
2003 ^a	14,923	84	2,842	16	17,765
Average	9,867	82.2	2,126	17.8	11,992

^a Preliminary data from WDFW November 17, 2003, memo, Laura Praye to Bob Leland

Table 3. Upper Columbia River steelhead spawning escapement estimates and percent of hatchery-origin fish in the spawning population (WDFW, unpublished data).

Spawn year	Above Wells Dam		Wenatchee/Entiat Combined	
	Total	Hatchery	Total	Hatchery
1998	4,107	97.3%	962	48.5%
1999	2,668	93.2%	564	13.5%
2000	3,557	88.7%	1,546	66.7%
2001	6,280	91.7%	2,243	33.2%
2002	18,146	95.3%	6,575	33.2%
2003	9,475	92.8%	3,425	39.8%
2004	7,505	88.5%	3,897	68.6%
Average	7,391	92.5%	2,745	43.4%

3.3 Other Projects Already in the Baseline

As mentioned in Section 1.1, a basin-wide monitoring plan has been developed. Research, monitoring, and evaluation projects which were underway when the basin-wide strategy was being developed were, in general, incorporated into the basin-wide strategy. For example, artificial propagation programs operated by the WDFW with funding from local public utility districts (PUDs) already have monitoring programs underway. Those programs included routine data collection activities such as annual redd counts that were encompassed in the new basin-wide strategy. The ongoing research, monitoring, and evaluation activities have previously undergone the ESA consultation process. Additionally, juvenile monitoring using rotary screw traps in the Okanogan Basin of ESA-listed UCR steelhead was authorized under Permit 1395. Permit 1395 authorizes capture, handle, and release up to 20 percent of the naturally produced and artificially propagated steelhead in the basin. Incidental mortality as a result of activities authorized in these permits is limited to two percent of the target species captured. Under this permit, the WDFW, with funding from Chelan PUD and Douglas PUD, could operate a smolt trap in the Okanogan River to achieve the same objectives as identified by the Colville Tribes in their permit application. A term and condition in Permit 1395 and in the proposed Permit 1520 is the coordination of research and monitoring efforts. To that end, NMFS requested and received a letter from WDFW indicating that the Colville Tribes have fully coordinated this proposal and that WDFW does not intend to operate a smolt trap in Okanogan River during the duration of Permit 1520 (through 2009) (WDFW 2005).

3.4 Factors Affecting the Environmental Baseline

Environmental baselines for biological opinions are defined by regulation at 50 CFR §402.02, which states that an environmental baseline is the physical result of all past and present state, Federal, and private activities in the action area along with the anticipated impacts of all proposed Federal projects in the action area (that have already undergone formal or early Section 7 Consultation). The environmental baseline for this Opinion is therefore the result of the impacts of a great many activities on UCR steelhead survival and recovery. Put another way, the baseline is the culmination of the effects that multiple activities have had on the species' biological requirements and, by examining those individual effects, it is possible to derive the species' status in the action area.

The best scientific information presently available demonstrates that a multitude of factors, past and present, have contributed to the decline of west coast salmonids by adversely affecting these essential habitat features. These factors are well known and documented in dozens—if not hundreds—of scientific papers, policy documents, news articles, books, and other media. It is therefore unnecessary to detail in this Opinion the many ways in which human activities and natural factors have affected the UCR spring Chinook salmon's and steelhead's habitat-related biological requirements; the following paragraphs constitute a brief summary of what the most recent accepted science has to say about how human action and natural processes have degraded essential steelhead habitat features in the UCR Basin.

Some activities in the action area (e.g., hydropower and agricultural development, particularly irrigation diversions) have had adverse effects on the habitat-related biological requirements of

UCR steelhead, while other activities have only affected some of those essential habitat features. For example, road building in UCR tributary basins has had a sizeable effect on stream substrates and water quality (through siltation), and road culverts have blocked fish passage, but such activities have not had much of an effect on water velocity. In another instance, timber harvest and grazing activities have affected—to greater or lesser degrees—all the factors except space and urban development has affected them all, but generally to a smaller degree in the largely rural UCR Basin. In short, nearly every widespread human activity in the basin has adversely affected some or all of the habitat features, and by disrupting those habitat features, these activities—coupled with past hatchery and fishery effects and occasional natural disturbances such as drought and fire—have had detrimental impacts on UCR steelhead and spring Chinook salmon health, physiology, numbers, and distribution in virtually every subpopulation and at every life stage. For detailed information on how various factors have degraded essential habitat features in the UCR Basin, see NMFS (2003c, 2003d, 2003e).

In conclusion, it is clear that the UCR steelhead biological requirements are currently not being met under the environmental baseline. Thus, their status is such that a substantial improvement in the environmental conditions of their habitat is needed (over those currently available under the environmental baseline). Any further degradation of the environmental conditions could have a large impact because the species is already at risk of going extinct. In addition, there must be continued efforts to minimize impacts caused by dams, harvest, hatchery operations, habitat degradation, and unfavorable natural conditions.

4 ANALYSIS OF EFFECTS

NMFS analyzes the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action that will be added to the environmental baseline. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for the justification. Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR §402.02).

The term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The proposed activities would result in take of endangered UCR steelhead in the form of “trap, capture, or collect.” Collected juvenile steelhead would be anesthetized, examined for marks or tags, enumerated, measured, weighed, and released. Some fish may have scales collected or receive an external mark or both.

The activities that would be authorized by Permit 1520 have the potential to directly affect ESA-listed UCR steelhead. The ESA Section 10(a)(1)(A) process includes applicant-proposed measures, and terms and conditions proposed by NMFS which function together to be protective of listed species. This section considers the potential effects of the proposed action on the ESA-listed ESU that occurs in the action area. Effects on the viability of an ESU, or its likelihood of achieving viability, are typically driven by effects on one or more of the populations or major population groups of which that ESU is composed. Actions may affect population viability more or less directly (for example, through large-scale changes in spawning, rearing, or migratory

habitat), but often the effect on populations comes via an aggregation of action effects on individuals. Therefore, an action's effects on individuals of a species results in a response by those individuals that may then result in a response by the population or major population group, and potentially, then, by the ESU.

4.1 Effects of Proposed Action on UCR Steelhead

The effects of the proposed action would result primarily from the capture, handling, and live release of juvenile steelhead. Because of the nature of effects, this action would be expected to affect individuals of essentially one population, that of the Okanogan River Subbasin.

The effects of juvenile fish trap operations were previously analyzed, with the conclusion that the impacts of analogous activities were not likely to jeopardize the ESU (NMFS 2003a). In that analysis, it was anticipated that smolt traps would be operated on several tributaries of the Columbia River, including the Okanogan River. Similar fish traps operated by the WDFW achieve an average sample efficiency of four to 20 percent of the emigrating population from a river or stream, depending on the river size, although under some conditions traps may achieve a higher efficiency for a relatively short period of time (NMFS 2003b). Based on this experience, NMFS expects the mortality of captured fish to be two percent or less on target species.

The specific Okanogan River impact level was estimated based on the previous analysis (NMFS 2003a). Following the same analysis as that for UCR spring Chinook salmon conducted for Permit 1493 (NMFS 2004c) and for UCR steelhead in Permit 1395 (NMFS 2003a). Artificial propagation programs release about 100,000 steelhead smolts annually into the Okanogan River that may be impacted by the proposed activity. Little is known about the number of natural produced steelhead smolts in the Okanogan, hence the need for this study. Chapman estimated that the habitat capacity above Wells Dam, which includes the Methow and Okanogan watersheds, could produce about 138,000 steelhead smolts (Ford *et al.* 2001). The Okanogan River Basin habitat is much more degraded than the Methow River Basin and likely produces less than 20 percent of the above Wells Dam production. If we use 20 percent of the above Wells Dam production as a generous estimate of natural production potential in the Okanogan then about 27,600 steelhead smolts may be produced annually in the Okanogan River Basin that potentially could be intercepted in the proposed trapping activities. Assuming trap efficiency of 20 percent about 5,520 naturally produced and 20,000 hatchery origin steelhead smolts might be captured, handled and released. Incidental mortality of two percent equals a mortality impact of 510 smolts (400 hatchery origin and 110 natural-origin). Converting this to adult equivalents (three percent survival smolt-to-adult, Ford *et al.* 2001) results in a maximum loss of up to 12 adult artificially propagated and three naturally produced adult steelhead. Considering that juvenile fish trap will likely not achieve an efficiency of 20 percent (for example, the Lower Wenatchee River trap has previously achieved only about a two percent efficiency), the numeric impact will likely be much less and the impact to the ESU as whole is not substantial.

The trapping, capturing, or collecting and handling process is likely to cause some stress on UCR steelhead, but they would be expected to recover rapidly from such stress. The primary factors that contribute to stress and mortality from handling are excessive doses of anesthetic, differences in water temperature, dissolved oxygen conditions, the amount of time that fish are

held out of water, and physical trauma. Stress on salmonids increases rapidly from handling if the water temperature exceeds 64.4°F (18°C) or dissolved oxygen is below saturation. Also, stress can occur if there are more than a few degrees difference in water temperature between the stream/river and the holding tank. The potential for unexpected injuries or mortalities to ESA-listed fish would be minimized in a number of ways described in the proposed action and the permit terms and conditions.

The trap would be checked and fish handled in the morning. This would ensure that the water temperature is at its daily minimum when fish are handled. Fish must not be handled if the water temperature exceeds 69.8°F (21°C). Sanctuary nets must be used when transferring fish to holding containers to avoid potential injuries. The investigator's hands must be wet before and during fish handling. Appropriate anesthetics must be used to calm fish subjected to collection of biological data. Captured fish must be allowed to fully recover before being released back into the stream and must be released only in slow water areas.

Marking, such as a small caudal fin clip, or tagging, such as PIT tagging, of hatchery and natural origin UCR steelhead juveniles would be used to determine trap efficiency and to assess juvenile seaward migration rate. Additionally, survival to adult may be determined based on PIT tag detections at dam or recoveries on spawning grounds or in broodstock.

The information gained is expected to be valuable in increasing our understanding to UCR steelhead populations and life history strategies. NMFS finds the measures above to minimize the impacts of the proposed activities adequate to protect the UCR steelhead ESU.

4.2 Cumulative Effects

Cumulative effects are defined in 50 CFR §402.02 as "those effects of future state, tribal, local or private actions, not involving Federal activities, that are reasonably certain to occur in the action area considered in this Opinion." Future Federal actions, including the ongoing operation of hatcheries, fisheries, and land management activities, are not considered within the category of cumulative effects for ESA purposes because they require separate consultations pursuant to Section 7 of the ESA after which they are considered part of the environmental baseline. Future state, tribal, local or private actions within the action area cannot be deemed reasonably likely to occur based on ESA implementing regulations.

The Endangered Species Consultation Handbook describes this standard as follows:

"Indicators of actions 'reasonably certain to occur' may include, but are not limited to: approval of the action by state, tribal or local agencies or governments (e.g., permits, grants); indications by state, tribal or local agencies or governments that granting authority for the action is imminent; project sponsors' assurance the action will proceed; obligation of venture capital; or initiation of contracts. The more state, tribal or local administrative discretion remaining to be exercised before a proposed non-Federal action can proceed, the less there is a reasonable certainty the project will be authorized."

There are, of course, numerous non-Federal activities that have occurred in the action area in the past, which have contributed to both the adverse and positive effects of the environmental baseline. This step of the analysis for application of the ESA Section 7(a)(2) standards requires the consideration of what of those past activities are "reasonably certain to occur" in the future within the action area.

First of all, any of these actions that involve Federal approval, funding, or other involvement are not considered "cumulative effects" for this analysis (see ESA definition, above). This Federal involvement will trigger ESA Section 7(a)(2) Consultation in the future. Once the consultation on those actions are completed, the effects may be considered part of the environmental baseline, consistent with the ESA regulatory definition of "effects of the action" (50 CFR §402.02). Thus, for example, state efforts to improve water quality in compliance with the Federal Clean Water Act would not be considered, because of the involvement of the EPA, until separate ESA consultations are completed. Others examples that would be included in the baseline upon completion of consultation include irrigation water withdrawals involving the U.S. Forest Service (e.g., right-of-way permits for irrigation canals) or agricultural practices that receive Federal funding through the U.S. Department of Agriculture.

Next, actions that do not involve Federal activities must meet the "reasonably certain to occur" test for NMFS to consider their effects in this Opinion. Recognizing that this is a narrower standard than used for NEPA purposes, not all of the actions identified in the NEPA process may be considered as "cumulative effects" for this ESA Section 7(a)(2) Consultation.

In reviewing the actions identified in cumulative effects analysis of the EA, after eliminating from consideration those with Federal involvement that would require Section 7 Consultations, NMFS concludes that the future abundance and productivity of the listed UCR steelhead, against which the effects of this action are considered, are likely to be improved, although to an unknown or possibly minor extent, over those reflected by the historical trends under the environmental baseline.

4.3 Integration and Synthesis

The proposed action of issuing Permit 1520 to the Colville Tribes would impact the UCR steelhead ESU. The monitoring activities could result in a lethal take potentially as high as, but likely substantially less than, two percent of the UCR steelhead smolts captured. This translates into a maximum numeric reduction of three naturally produced adult steelhead annually.

Benefit to listed fish will accrue in three different ways: (1) through the generation of information that supports management of these species with respect to exploitation and recovery planning; (2) through the generation of information that supports the planning, development, and implementation of restoration and recovery actions that directly benefit the listed populations; and (3) through the generation of information that supports the planning, development, and implementation of management actions that indirectly impact the listed population.

Listed fish will benefit directly and indirectly through the development of a comprehensive status and trend monitoring program in the Okanogan River Basin because Federal, state and

tribal resource managers will have population and habitat data of known quality (spatio-temporal resolution, as well as of known accuracy and precision) upon which to base resource management decisions. Additionally, quantifying the impacts of restoration, recovery, and other resource management actions on populations of listed anadromous salmonids at the watershed scale within the Okanogan River Basin is of critical direct benefit to these fishes. Hundreds of millions of dollars have been spent on habitat and population manipulation actions with little or no rigorous assessment of the biological impact these actions had on populations of listed anadromous salmonids. This issue is a critical shortcoming of many regional management plans, and is acknowledged to be of high priority, but is only occasionally addressed during the design and implementation of action or monitoring programs. The proposed work here directly addresses this issue by integrating multiple watersheds within the UCR Basin in a monitoring program that captures population productivity and abundance metrics, and the aggregation of past and on-going management actions.

5 CONCLUSION

NMFS' approach for determining whether the proposed action is likely to jeopardize the continued existence of ESA-listed salmonids or destroy or adversely modify proposed critical habitat is based on an analysis of the existing or potential risk of hazards posed by the action. NMFS has considered the analysis presented above and the likelihood for survival and recovery of the UCR steelhead ESU under the environmental baseline in making its jeopardy determination.

NMFS must weigh the potential benefits with the potential adverse effects when deciding whether the contemplated actions will appreciably reduce the likelihood of the UCR steelhead survival and recovery – the critical determination in issuing any biological opinion.

After reviewing the current status of UCR steelhead, the environmental baseline for the action area, the effects of the proposed artificial propagation activities in the UCR Basin, including anticipated beneficial results of improved scientific information, and cumulative effects, NMFS concludes that the issuance of ESA Section 10 Permit 1520, including conditions as described above, for the activities proposed, is not likely to jeopardize the continued existence of the listed ESU or to destroy or adversely modify their habitat.

6 INCIDENTAL TAKE STATEMENT

Since this is a direct take permit for the ESA-listed species under NMFS jurisdiction which occur in the action area, no incidental take is anticipated and therefore no incidental take statement is necessary.

7 RE-INITIATION OF CONSULTATION

This concludes formal consultation of the actions outlined in the applications for Section 10(a)(1)(A) permits. As provided in 50 CFR §402.16, re-initiation of formal consultation is required if: (1) the amount or extent of annual take, either intentional take or incidental take, is exceeded or is expected to be exceeded; (2) new information reveals effects of the agency action

that may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect to listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the operation that results in exceeding take must cease, and consultation must be reinitiated.

8 MAGNUSON-STEVENS ACT ESSENTIAL FISH HABITAT CONSULTATION

8.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS must provide conservation recommendations for any Federal or state action that would adversely affect EFH (§305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

Essential Fish Habitat means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

An EFH consultation with NMFS is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

8.2 Identification of Essential Fish Habitat

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Federally-managed Pacific salmon: Chinook, and coho, and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

8.3 Proposed Action and Action Area

For this EFH consultation, the proposed actions and action area are as described in this Opinion (Section 2). The actions are the issuance of a scientific research Permit 1520 pursuant to Section 10(a)(1)(A) of the ESA. The proposed action area is a portion of the Okanogan River, a tributary to the Columbia River, and is part of the EFH for Chinook salmon. Assessment of the impacts on these species' EFH from the above proposed action is based on this information.

8.4 Effects of the Proposed Action

Based on information provided by the action agencies, and NMFS analysis in the ESA consultation above, NMFS believes that the effects of this action on EFH are likely to be within the range of effects considered in the ESA portion of this consultation.

8.5 Conclusion

Using the best scientific information available and based on its ESA consultation above, as well as the foregoing EFH sections, NMFS determined that the magnitude and duration of habitat disturbance are small enough that they don't constitute a reduction in quality and/or quantity of EFH, individually or cumulatively.

8.6 Consultation Renewal

NMFS must reinitiate EFH consultation if the proposed actions are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR Section 600.920(k)).

9 DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) (“Data Quality Act”) (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Opinion addresses these DQA components, documents compliance with the DQA, and certifies that this Opinion has undergone pre-dissemination review.

9.1 Utility

These ESA Section 7 and MSA consultations on juvenile anadromous fish monitoring in Okanogan River Washington will not jeopardize the affected ESUs. Therefore, NMFS can issue Permit 1520. The intended user is the Colville Tribes. The scientific community, resource managers, and the stakeholders benefit from the consultation, particularly through the collection of information that could help refine steelhead conservation and management in the future.

9.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, “Security of Automated Information Resources,” Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

9.3 Objectivity

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased, and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA Regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.920(j).

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the literature cited section. The analyses in this Opinion/EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data, and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

10 REFERENCE

10.1 Federal Register Notices

- 62 FR 43937. August 18, 1997. Final Rule, Endangered and threatened species: Listing of Several Evolutionary Significant Units (ESUs) of West Coast Steelhead.
- 65 FR 7764. February 16, 2000. Final rule: Designated Critical Habitat: Critical Habitat for 19 Evolutionarily Significant Units of Salmon and Steelhead in Washington, Oregon, Idaho, and California.
- 69 FR 33102. June 14, 2004. Notice of Endangered and Threatened Species: Proposed Listing Determinations for 27 ESUs of West Coast Salmonids.
- 69 FR 74572. December 14, 2004. Notice of Proposed Rule: Endangered and Threatened Species; Designation of Critical Habitat for 13 Evolutionarily Significant Units of Pacific Salmon (*Oncorhynchus spp.*) and Steelhead (*O. mykiss*) in Washington, Oregon, and Idaho.

10.2 Literature Cited

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